Water Quality Summary Report No. 33

1998 Follow-up Studies to Ground Water Contamination Detections

Idaho Department of Health and Welfare
Division of Environmental Quality
July 1999

CANYON COUNTY

Lake Lowell

The Lake Lowell study area is in Canyon County. The location is between the lower dam on Lake Lowell and the Snake River. It is in a sparsely populated rural area of large acreage home sites with some subdividing of homes on just a few acres. Alfalfa and wheat were the major crops growing during this sampling period. The topography is undulating to the terraces overlooking the Snake River.

The Statewide Monitoring well in this study area had elevated arsenic of 58 ug/l. The well is 247 feet deep with a 239-foot casing. The well was drilled in 1983. It has an 18-foot surface seal of puddling clay.

Four well drillers' reports were found in the area near the Statewide Monitoring well. Two of the well owners responded allowing the sampling of their wells. Well # L1 was 190 feet deep and 244 feet deep for L2. Both had elevated arsenic of 50 and 39 ug/l, respectively. The nitrate levels for the wells were a low 0.51 and 2.06 mg/l, respectively. Information on arsenic was provided to the well owners.

This appears to be the first of many sites along the Snake River where elevated arsenic levels will be discussed. The diagram for the area shows elevated arsenic from the Lake Lowell area to Huston (see Figures 5 page 11, 6 page 12, 7 page 13 and 8 page 14). The consistent elevated levels of arsenic in this area will require additional sampling before the cause of the contamination can be determined. Research on the subject alludes to the geology and hydrogeology of the area. Geothermal water along the Snake River has shown elevated arsenic, sulfate, zinc and fluoride levels in the ground water in a reduced environment (Lindholm 1983, Parliman 1983, Wood 1987, and Wood 1988). The elevated arsenic may be a consequence of geothermal water mixing with the cold water system. Health effects of arsenic over 0.05 milligrams per liter may include gastrointestinal problems, changes in fingernails and toenails, abnormal skin thickening or pigment and long term exposure includes nerve damage (including numbness in limbs) and skin cancer. However, sensitivity to arsenic varies between individuals.

North Marsing

The North Marsing study area is in Canyon County near Highway 55 in the Sunnyslope area. Topographic features are undulating. It is in a sparsely populated rural area of large orchards with some subdividing of homes on just a few acres. Just south of the study area is a large, extinct basalt vent called Lizard Butte.

The Statewide Monitoring well in this area had elevated arsenic of 85 ug/l. The well is 80 feet deep with a 79 feet of casing. The surface seal is 18 feet deep of puddling clay. The well was drilled in 1971.

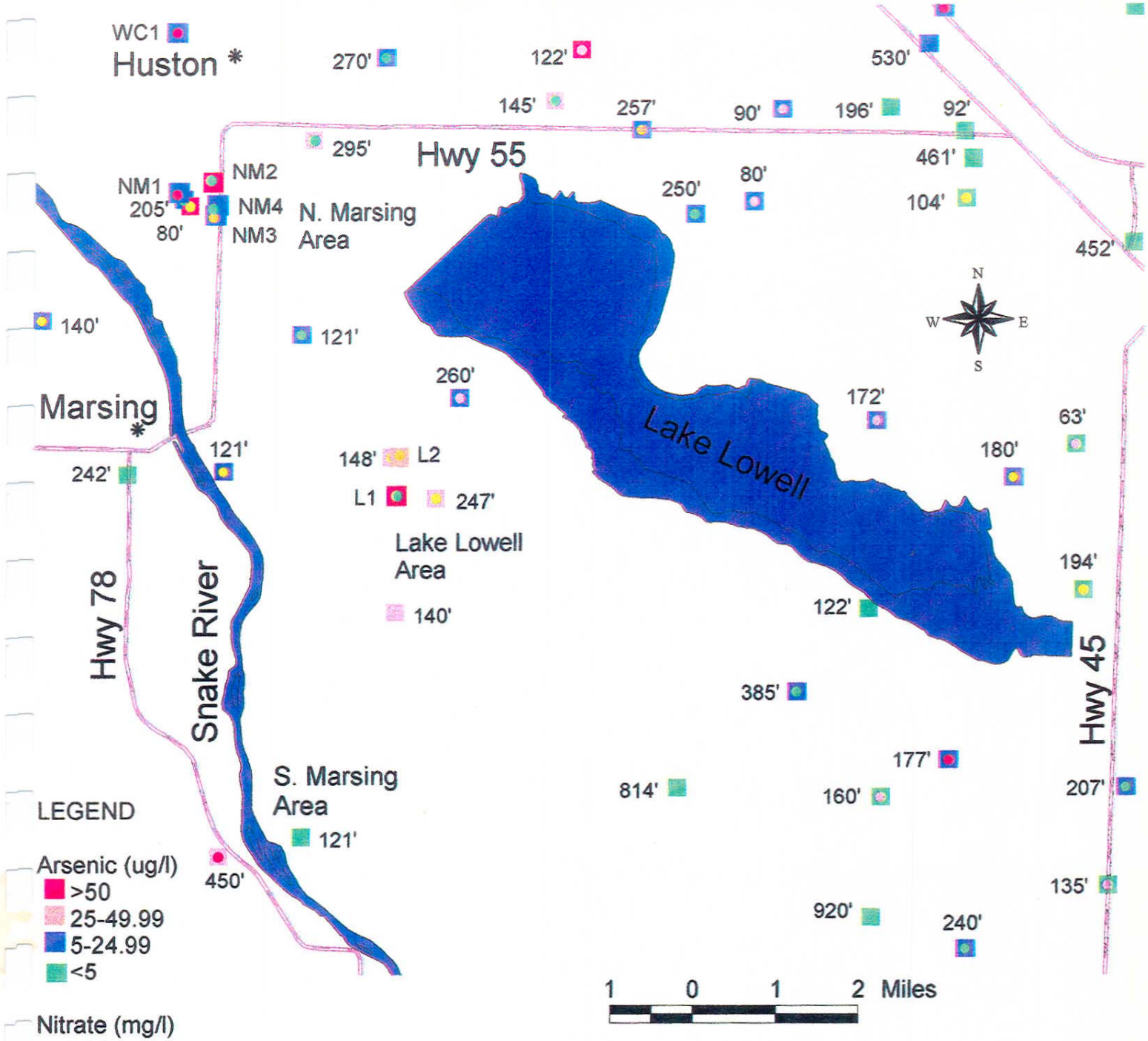

Figure 5. 1998 Follow-up Ground Water Study in the Lake Lowell and Marsing Areas plus Historic Data

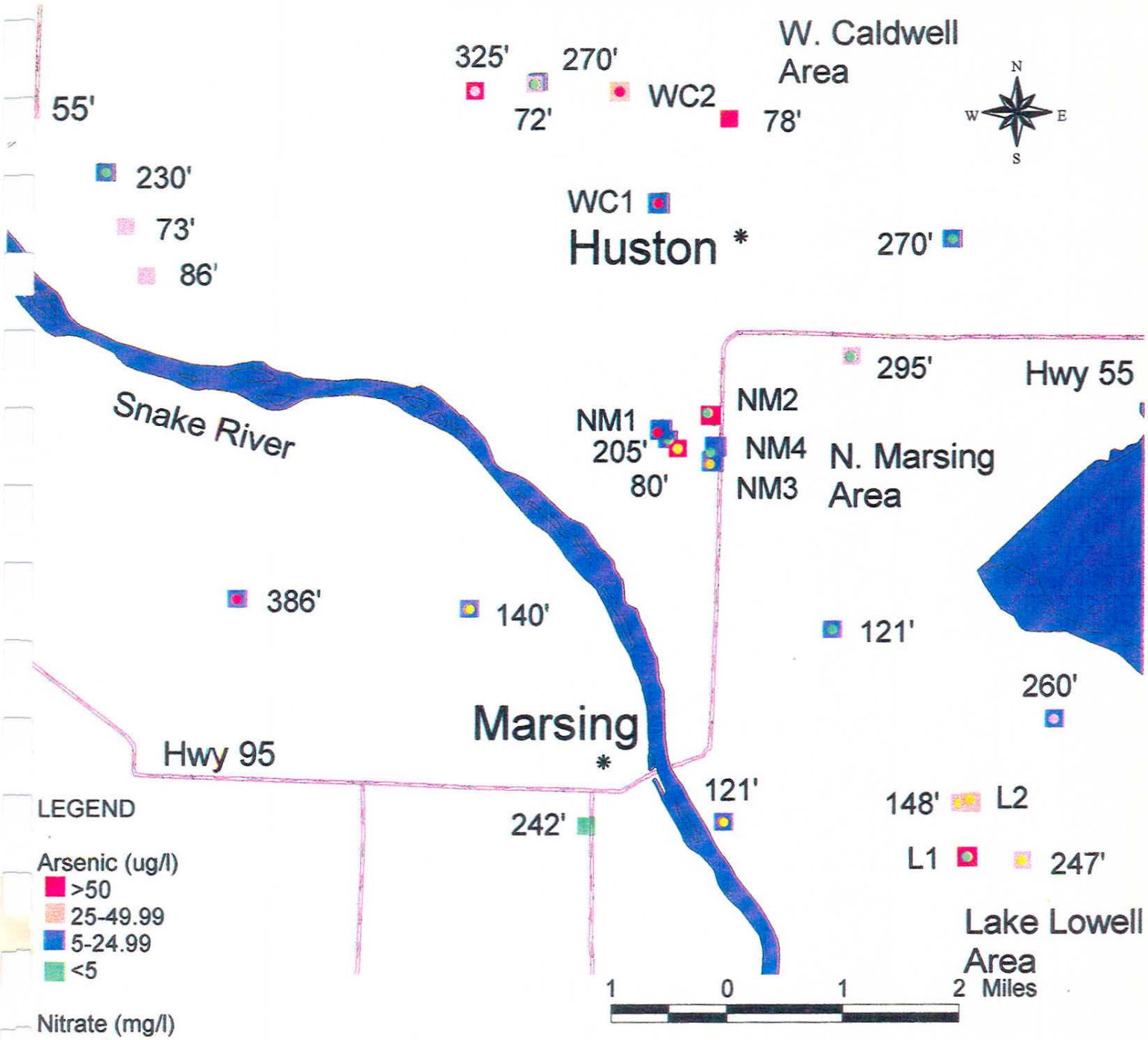

Figure 6. 1998 Follow-up Ground Water Studies in the W. Caldwell and N. Marsing Areas plus Historic Data

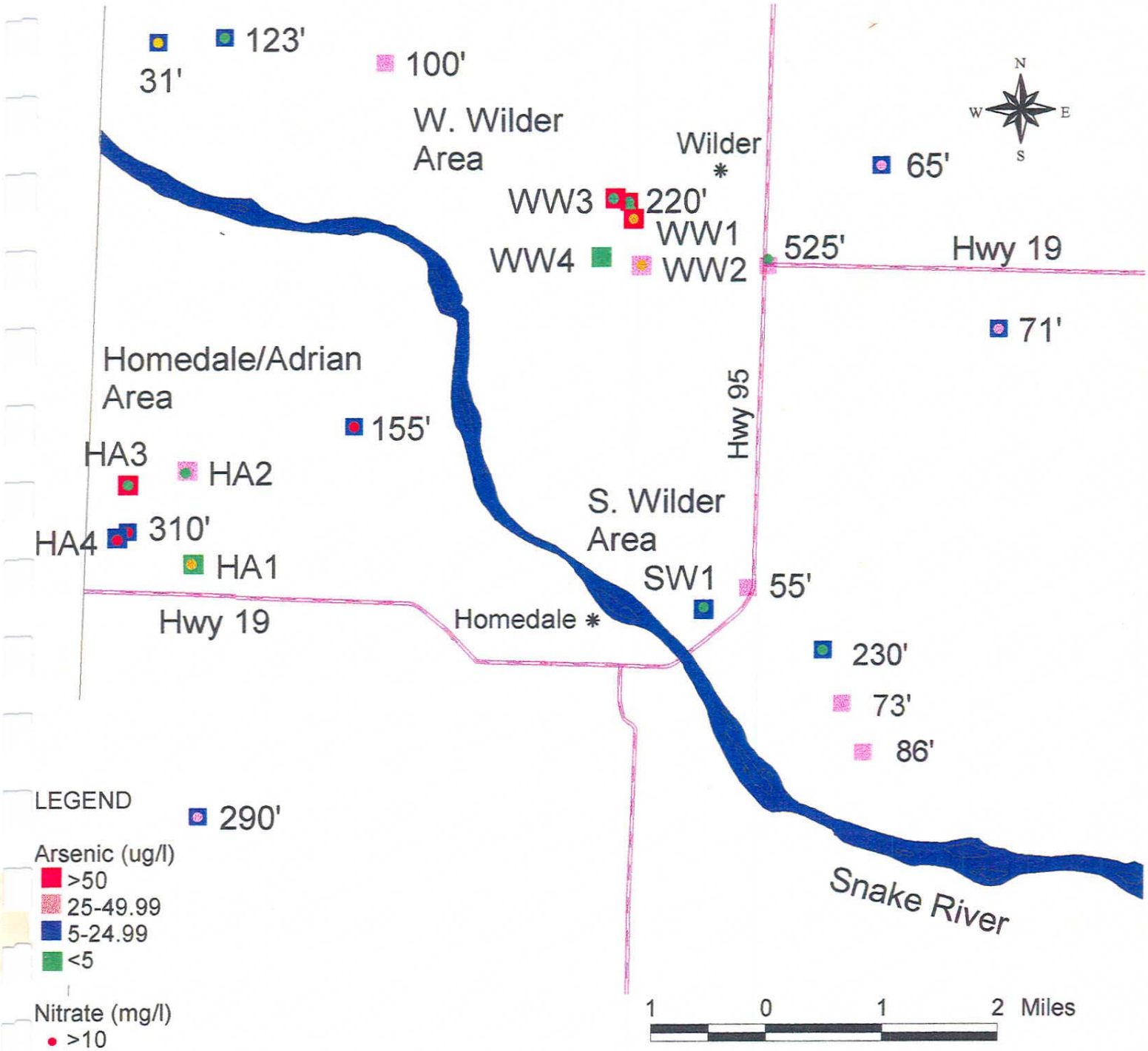

Figure 7. 1998 Follow-up Ground Water Studies in the W. Wilder, S. Wilder and Homedale/Adrian Areas plus Historic Data

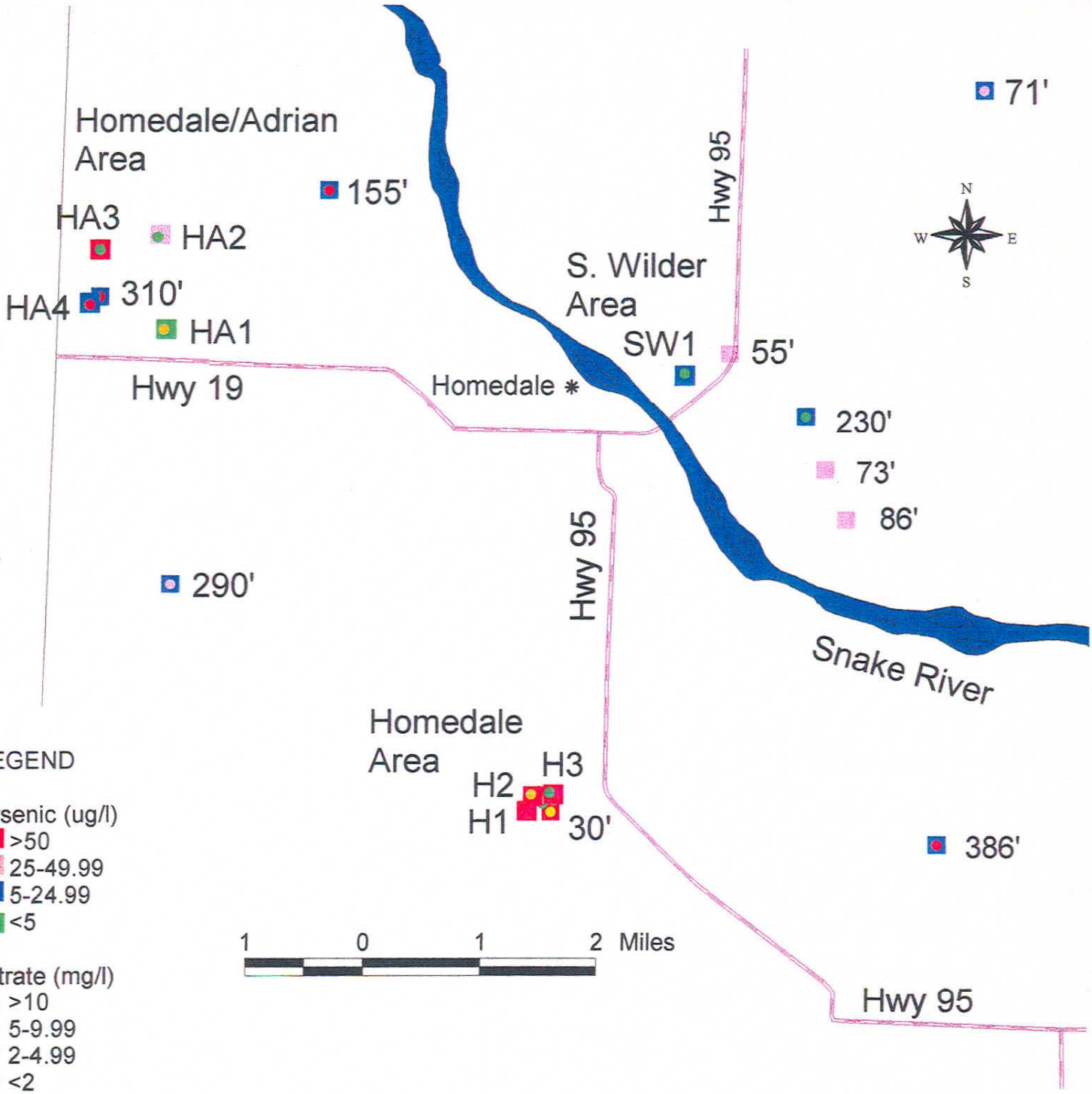

Figure 8. 1998 Follow-up Ground Water Studies in the S. Wilder, Homedale and Homedale/Adrian Areas plus Historic Data

Four well drillers' reports were found for wells near the Statewide Monitoring well. Three of the well owners gave permission to sample their wells. A fourth well, well # NM4, was added while out sampling. This well owner requested the sampling and a well drillers report was available for his well. The nitrate levels in the sampled wells were low to moderate, 1.17 - 6.01 mg/l. The well depths were 98 to 120 feet deep. The arsenic levels were 21 to 68 ug/l. The well owners were mailed information on what arsenic and nitrate are and what they can do in regard to elevated arsenic and nitrate in their well water.

This appears to be another area along the Snake River that has elevated arsenic levels. The diagram for the area shows elevated arsenic from the Lake Lowell area to Huston (see Figures 5 page 11, 6 page 12, 7 page 13 and 8 page 14). The consistent elevated levels of arsenic in this area will require additional sampling before the cause of the contamination can be determined. Research on the subject alludes to the geology and hydrogeology of the area. Geothermal water along the Snake River has shown elevated arsenic, sulfate, zinc and fluoride levels in the ground water in a reduced environment (Lindholm 1983, Parliman 1983, Wood 1987, and Wood 1988). The elevated arsenic may be a consequence of geothermal water mixing with the cold water system.

North Nampa

The North Nampa study area is in Canyon County on the south side of Highway 20/26 and west of Franklin Road. It is in a sparsely populated rural area with some subdividing of homes on just a few acres. The topography is a flat valley. Common row crops are sugar beets, alfalfa and potatoes.

The Statewide Monitoring well is 95 feet deep with a 90-foot casing. The surface seal of well cuttings and slurry pit is 20 feet deep. The well was drilled in 1982. The nitrate level was 17.2 mg/l from the Statewide Program results.

Four well drillers' reports were found in the area of the Statewide Monitoring well. Two well owners agreeded to be part of the ground water study. These two wells are of similar depth and close proximity to the Statewide Monitoring well. Neither wells had elevated nitrate, 1.05 mg/l in well # NN1 and 2.7 mg/l in well #NN2. The historic data in the area does not show the nitrate problem that has been identified in the Statewide Monitoring well (see Figure 9 page 16). The Statewide Program well is the only well in this area where nitrate level exceeds the MCL.

South Wilder

The South Wilder study area is in Canyon County about three miles south of Wilder near Highway 95. It is in a sparsely populated rural area with some subdividing of homes on just a few acres. The topography is undulating.

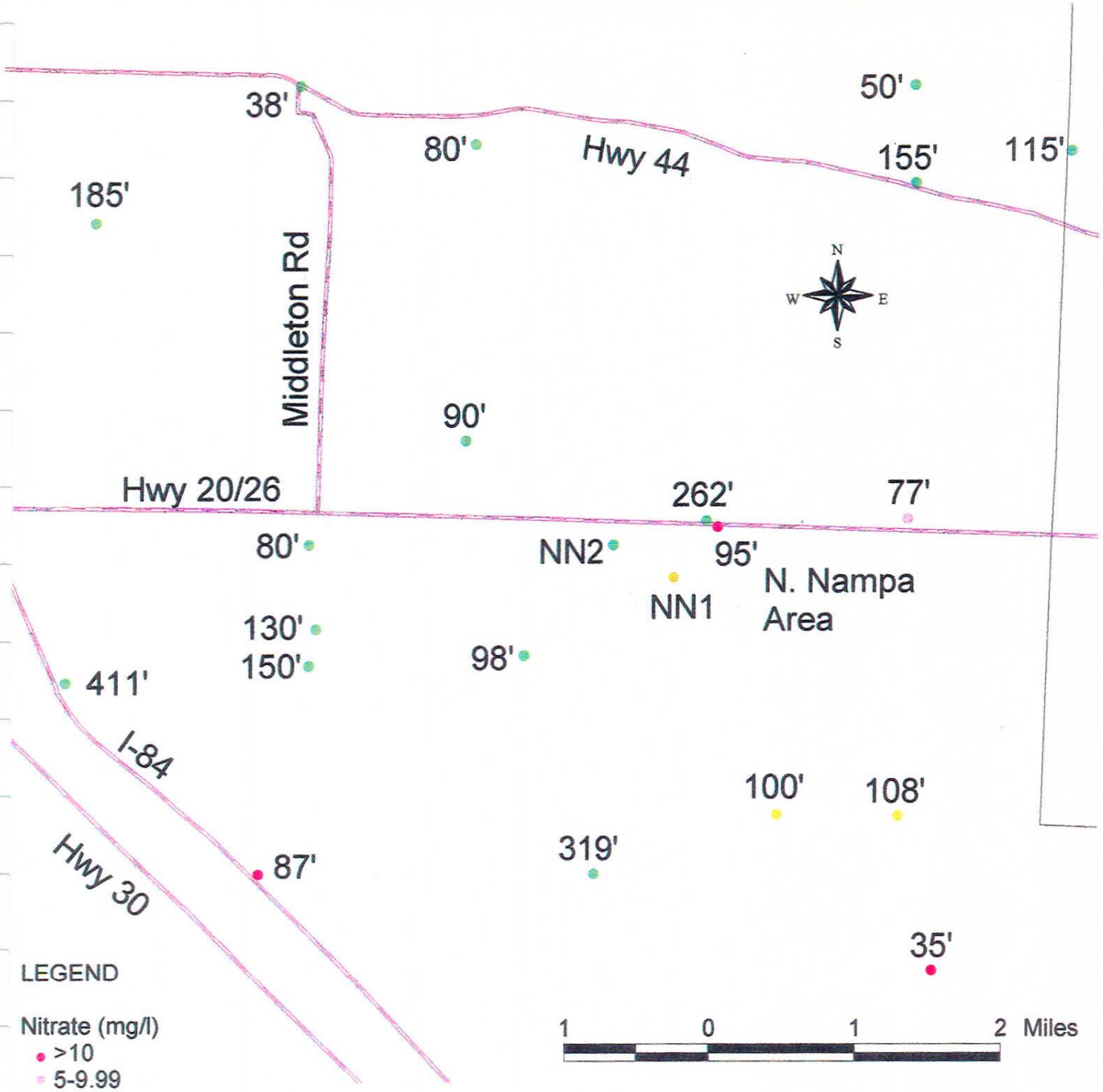

Figure 9. 1998 Follow-up Ground Water Study in N. Nampa Area plus Historic Data

The Statewide Monitoring well had elevated arsenic of 50 ug/l. The well is 55 feet deep with 40 feet of casing. The 18-foot surface seal is composed of well cuttings. The well was drilled in 1976.

Only two well drillers' reports could be found near the Statewide Monitoring well. Only one well owner responded regarding the sampling of his well. His 78-foot well had elevated arsenic of 21 ug/l, which is less than half the concentration found in the Statewide Monitoring well. Arsenic information was mailed to the well owner with his results.

The consistent elevated historic level of arsenic shows that additional sampling will need to be conducted before the cause of the contamination can be determined (see Figure 7 page 13). This appears to be another site along the Snake River that has elevated arsenic levels. The diagram for the area shows elevated arsenic from the Lake Lowell area to Huston (see Figures 5 page 11, 6 page 12, 7 page 13 and 8 page 14). The consistent elevated levels of arsenic in this area will require additional sampling before the cause of the contamination can be determined. Research on the subject alludes to the geology and hydrogeology of the area. Geothermal water along the Snake River has shown elevated arsenic, sulfate, zinc and fluoride levels in the ground water in a reduced environment (Lindholm 1983, Parliman 1983, Wood 1987, and Wood 1988). The elevated arsenic may be a consequence of geothermal water mixing with the cold water system.

West Caldwell

The West Caldwell study area is in Canyon County, about five miles west of Caldwell in Lower Deer Flat area just south of Pipe Gulch. It is in a sparsely populated rural area with some subdividing of homes on just a few acres. The topography is undulating.

The Statewide Monitoring well had elevated arsenic of 120 ug/l, and elevated nitrate of 14 mg/l. The well is 78 feet deep with a 78 feet of casing. The 35-foot surface seal is puddling clay. The well was drilled in 1974 and is used for irrigation purposes.

Five well drillers' reports were found near the Statewide Monitoring well. Only two well owners allowed their wells to be sampled. The wells were 50 and 102 feet deep. The arsenic results were 13 and 31 ug/l and nitrate concentrations were 30 and 14.3 mg/l in the 50 and 102-foot well; respectively. The well owners were mailed information on arsenic and nitrate.

This area needs additional sampling to determine the cause of the elevated nitrate. The elevated arsenic may be naturally occurring. Both constituents need to be address with any additional sampling. The area does not have any obvious potential cause for the nitrate. There is the agricultural land-use that is similar to other areas that do not have elevated nitrate.

Topographically, the area has numerous gulches and drains, in addition to the normal surface water irrigation system. Perhaps this extra water movement allows more movement of nutrients (see Figure 6 page 12).

West Wilder

The West Wilder study area is in Canyon County about a mile west of Wilder. It is in a sparsely populated rural area with some subdividing of homes on just a few acres. The topography is undulating to the terraces overlooking the Snake River.

The Statewide Monitoring well had elevated arsenic of 46 ug/l. The well is 220 feet deep that is cased to 179 feet. The 18-foot surface seal is bentonite. The well was drilled in 1989.

Four well drillers' reports were found near the Statewide Monitoring well. Two of the well owners allowed their wells to be included in the study. Two more wells were added while out in the field, by request of the well owners. A well drillers' report was located for one of the wells, well # WW4. The second well depth was known, since it was a new well, no well drillers' report could be found. Three of the wells had arsenic levels of 37 to 58 ug/l. The fourth well, well # WW2 was <0.01 mg/l for arsenic. Well # WW2 and WW4 were the two wells at the edge of the terrace overlooking the Snake River and were the only wells that had a hydrogen sulfide smell in the water during the sampling. All four wells had low nitrate levels, the highest nitrate level was in well # WW2 which was 2.68 mg/l.

This appears to be another site along the Snake River that has elevated arsenic levels (see Figure 7 page 13). The diagram for the area shows elevated arsenic from the Lake Lowell area to West Wilder (see Figures 5 page 11, 6 page 12, 7 page 13 and 8 page 14). The consistent elevated levels of arsenic in this area will require additional sampling before the cause of the contamination can be determined. Research on the subject alludes to the geology and hydrogeology of the area. Geothermal water along the Snake River has shown elevated arsenic, sulfate, zinc and fluoride levels in the ground water in a reduced environment (Lindholm 1983, Parliman 1983, Wood 1987, and Wood 1988). The elevated arsenic may be a consequence of geothermal water mixing with the cold water system.